IN THE CLAIMS:

1.   (Currently Amended) A projection electron lithography system, comprising:

a lithography tool for emitting a beam of electrons and producing measurement information; and

a processor including,

at least one <u>pre-existing</u> model for producing predictive information, and

an estimator for controlling placement of the beam of electrons based on the predictive information from said at least one <u>pre-existing</u> model and measurement information from said lithography tool.

2.   (Original) The system of claim 1, wherein said estimator compensates for heating and beam drift effects.

3.   (Original) The system of claim 1, wherein said estimator is a Kalman filter, using least-squares based linear matrix algebra.

4.   (Original) The system of claim 1, wherein said system is a SCALPEL system.

5.   (Currently Amended) The system of claim 3, wherein said at least one <u>pre-existing</u> model includes a plurality of different <u>pre-existing</u> models and said Kalman filter is an adaptive Kalman filter, wherein said adaptive Kalman filter iteratively selects one of <u>said</u> ~~the~~ plurality of different <u>pre-existing</u> models until a best one of <u>said</u> plurality of different <u>pre-existing</u> models emerges.

6.   (Currently Amended) The system of claim 3, wherein said at least one <u>pre-existing</u> model includes a plurality of different <u>pre-existing</u> models and said Kalman filter is an adaptive Kalman filter, said adaptive Kalman filter having a tunable strength parameter to

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determine an optimal adaptation weighting criterion.

7.   (Currently Amended) The system of claim 5, wherein said ~~the~~ plurality of different pre-existing models includes three or more pre-existing models.

8.   (Currently Amended) The system of claim 6, wherein said ~~the~~ plurality of different pre-existing models includes three or more models.

9.   (Currently Amended) A process for controlling projection electron lithography, comprising:

emitting a beam of electrons;

producing measurement information on said emitting step;

producing predictive information related to the projection electron lithography process based on at least one pre-existing model, and

controlling placement of the beam of electrons based on the predictive information and the measurement information.

10.   (Original) The process of claim 9, wherein said controlling step is implemented as a Kalman filter using least-squares based linear matrix algebra.

11.   (Original) The process of claim 9, wherein said controlling step compensates for heating and beam drift effects.

12.   (Original) The process of claim 9, wherein said process is a SCALPEL process.

13.   (Currently Amended) The process of claim 9, wherein the predictive information is produced by a plurality of different pre-existing models, wherein said controlling step iteratively selects one of said ~~the~~ plurality of different models until a best one of said plurality of different models emerges.

14.	(Currently Amended) The process of claim 9, wherein the predictive information is produced by a plurality of different <u>pre-existing</u> models, wherein said controlling step has a tunable strength parameter to determine an optimal adaptation weighting criterion.

15.	(Currently Amended) The process of claim <u>13</u> ~~14~~, wherein the plurality of different models includes three or more models.

16.	(Original) The process of claim 14, wherein the plurality of different models includes three or more models.

17.	(New) A projection electron lithography system, comprising:

a lithography tool for emitting a beam of electrons and producing measurement information; and

a processor including,

a plurality of different pre-existing models for producing predictive information, and

an adaptive estimator that iteratively selects a best one of said plurality of pre-existing models and controls placement of said beam of electrons based on said predictive information from said best one and measurement information from said lithography tool.

18.	(New) The system of claim 17 wherein said plurality of different pre-existing models are only directed to producing said predictive information for corrections associated with a die scale.

19.	(New) The system of claim 17 wherein said adaptive estimator employs a tunable strength parameter to determine an optimal adaptation weighting criterion of said predictive information and said measurement information.

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20.   (New) The system of claim 17 wherein said system is a SCALPEL system and said adaptive estimator is an adaptive Kalman filter.